Chapter 56

LANDING LAMP, TYPE J, Mk. 2

LIST OF CONTENTS

LIST OF ILLUSTRATIONS

LEADING PARTICULARS

Landing lamp, Type J, Mk. 2	*Ref. No.* 5CX/5009
Lamp, filament, 240 *watts (medium prefocus cap)*	*Ref. No.* 5L/9954717
Operating unit	*Ref. No.* 5UD/6230
Mounting rig	*Ref. No.* 5CX/5120
Front glass	*Ref. No.* 5CX/1517
Weight	6·8 *lb*
Overall depth, outer housing	5 *in*

1. The Type J, Mk. 2, landing lamp is widely used in military aircraft. It incorporates an electrically driven operating mechanism and can be remotely controlled. The beam selection, for landing and taxying is arranged by the use of alternative "OUT" limit switches. This lamp is a strengthened version of the Type J, lamp and will eventually supersede it. Like the Type J, it consists of three main assemblies, namely: the outer housing, the operating mechanism and the filament housing.

DESCRIPTION

Outer housing (*fig.* 1)

2. This is a fabricated coned unit having a flanged rim. The rim is held clamped between the plates of a mounting rig and carries the weight of the landing lamp in the aircraft. The operating mechanism is secured to the side of the outer housing by eight screws. Two plates fitted between the operating unit and the outer housing are for strengthening purposes and are secured each side of the lamp.

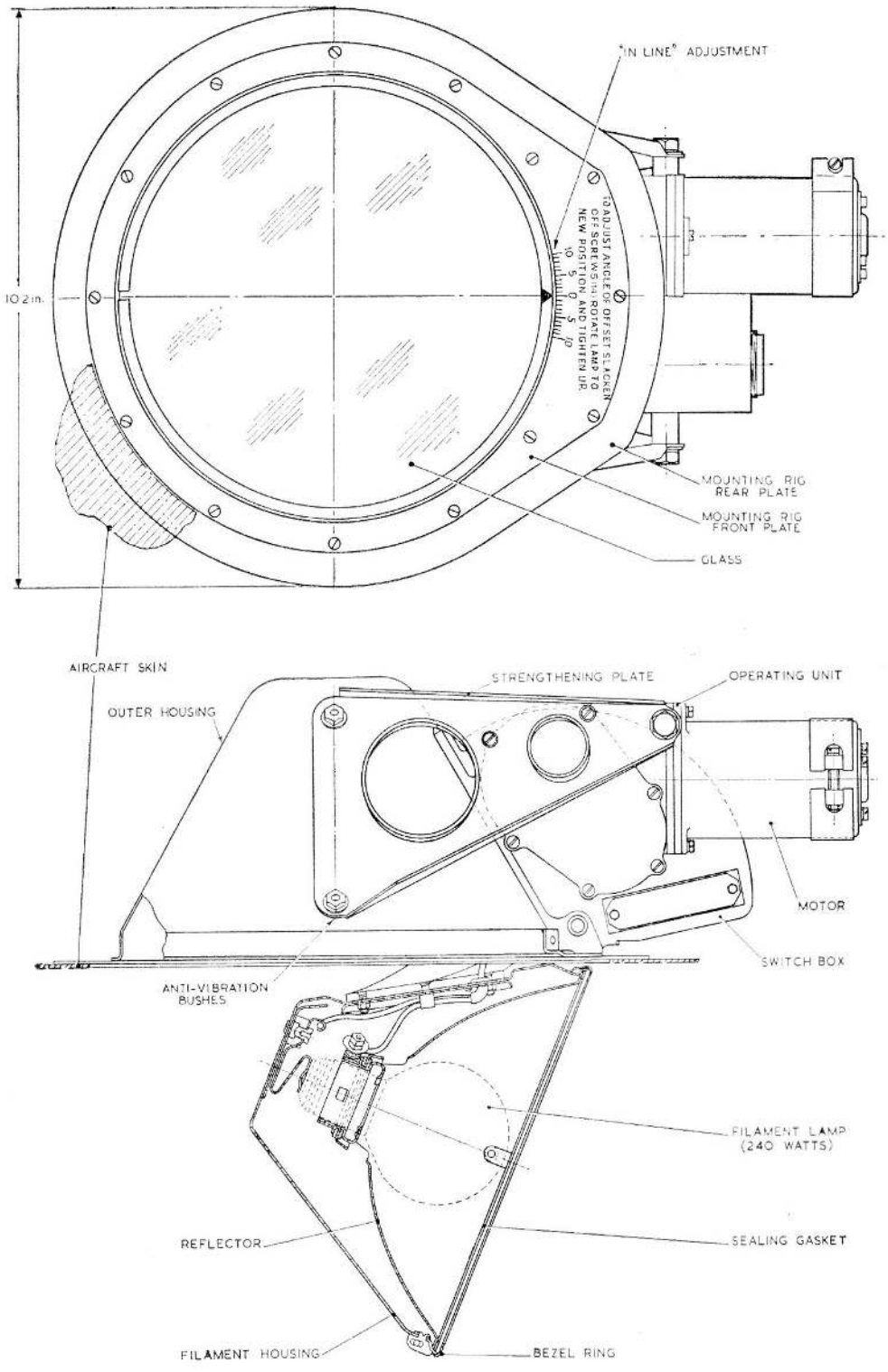

Fig. 1. Type J, Mk. 2 landing lamp

Two rubber bushes fixed to the inside of the outer housing prevent vibration when the filament housing is fully retracted.

Mounting rig

3. This consists of two metal plates, secured together by screws, between which is clamped the flanged rim of the outer housing. The larger metal plate fits over the outer housing locating behind the rim and is secured to the airframe structure. The smaller, front plate of the mounting rig has a circular hole through which the retractable filament housing operates. A scale is engraved round a short length of the periphery of this hole. The mounting rig is a separate assembly and is not normally supplied with the landing lamp.

Beam "in-line" adjustment

4. An index mark on the bezel ring of the front glass (*fig.* 1) registers against the scale on the mounting rig front plate. When the fourteen clamping screws are slackened the whole lamp may be rotated in its mounting rig. This permits adjustment of the beam within ± 10 deg. either side of the fore-and-aft line of the aircraft.

Operating mechanism

5. The operating unit of the Type J, Mk. 2 landing lamp is fully described in A.P. 4343D, Vol. 1, Book 3, Sect. 16. The motor is an alternative field, reversible, series type. It has a spring-loaded clutch which is set to slip when the pressure at the centre of the glass is between 37–70 lb. Deadbeat action of the motor is obtained by the incorporation of an electro-magnetic brake.

6. The motor, driving through reduction gearing, operates a pinion meshing with a quadrant rack. To this quadrant is riveted the actuating arm casting which carries the retractable filament housing, and through which flexible cables pass from the switchbox to the bulb holder.

Switchbox

7. The gearing quadrant spindle extends into the switchbox where it carries a moving switch arm. This switch arm carries a spigot which trips a switch lever carrying a contact. This contact makes with a fixed contact thereby completing the filament lamp circuit. These contacts are not operated until the filament housing is approximately half extended. The moving switch-arm, acting as a cam, mechanically operates limit switches, one at the fully retracted position and two at the extended, "high" and "low" positions. These limit switches are set by the manufacturers and under normal operating conditions should not need adjustment.

Filament housing

8. The filament housing is a fabricated cone having a flanged rim into which the front glass and the rim of the reflector are fitted. At the apex of the cone is fixed a spring contact which bears on the centre contact of the filament bulb.

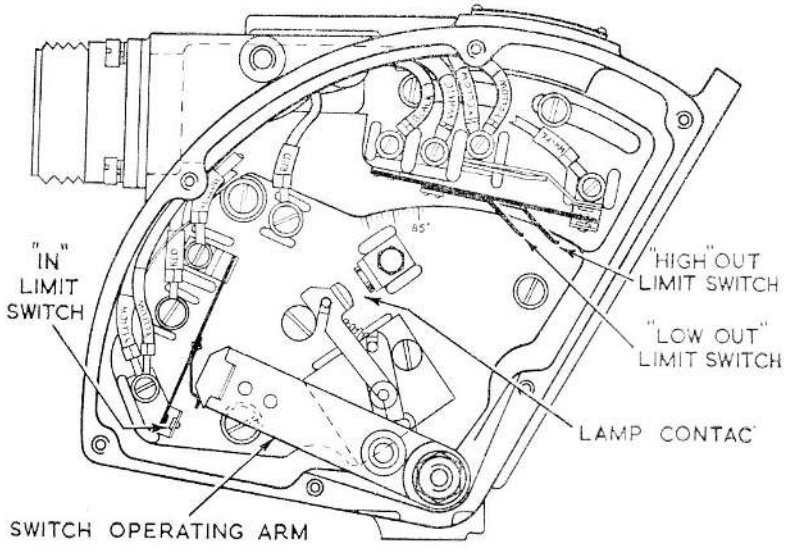

Fig. 2. Operating unit with cover removed

The front glass, with its sealing ring, is secured by a bezel ring and located by a small bracket. The complete housing is held by six screws and nuts to the actuating arm.

Reflector and bulb holder

9. The reflector is located in the rim of the filament housing and secured by two screws and nuts. At its centre is the bulb holder which has a clamp fitting forming the electrical connection to the body of the lamp cap. The front of the bulb holder is slotted to correspond with the flange of the filament bulb cap and so assures correct positioning of the bulb.

Filament lamp

10. The light source in this landing lamp is a single, coiled coil, gas-filled, 240-watt filament bulb. The location of the filament relative to the bulb cap is made within fine limits to ensure correct focusing when bulbs are renewed. The bulb has a medium pre-focus cap, the flange of which ensures that it can be inserted in the holder in the correct position only.

Electrical connections (*fig.* 3)

11. The control and filament circuits are supplied from the 28V source and connected through a Type M, six-pole, 7 amp. socket (*Ref. No.* 5X/766) at the lamp switchbox. The control circuit, fed from a 5 amp. fuse, is taken through a three-position switch. The OFF position is used for housing or retracting the lamp; the LOW and HIGH positions select extended positions for either landing or taxying. The filament circuit has a separate 20 amp. fused supply and is not completed until the lamp housing has travelled to approximately the half extended position.

Operation

12. Selection of LOW at the control switch completes a circuit through the "low" limit switch, the "extend" field of the motor and the brake. The lamp housing will move until the switch-arm causes the "low" limit switch contact to open and, at the same time, closes a contact in the "retract" field circuit. If further out movement of the lamp is required, i.e., if HIGH is elected, the "extend" field is completed through the "high" limit switch.

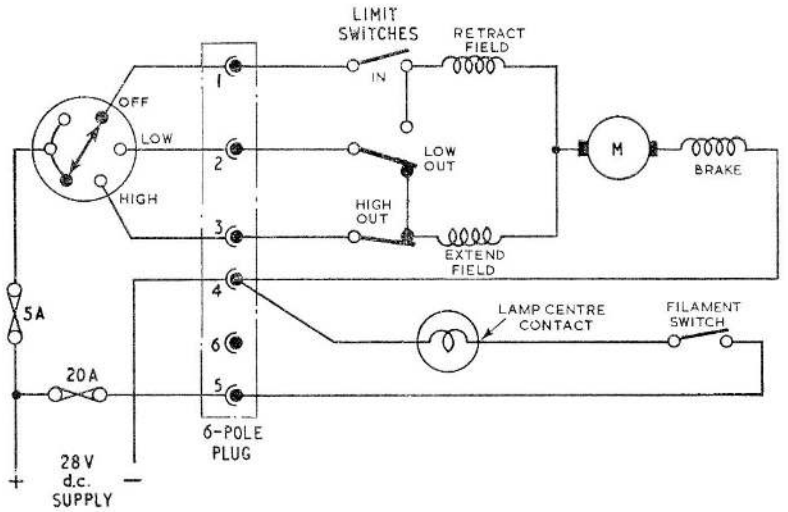

Fig. 3. Circuit diagram

13. If the LOW position is now selected the "retract" field circuit is completed through the "retract" contacts of the "low" limit switch. The motor will now reverse direction of drive and the lamp housing will retract until the low limit "retract" contacts open. If full retraction is required, i.e., OFF is selected, the motor "retract" field is completed through the "in" limit switch. This switch is mechanically operated by the switch-arm, to open when the lamp housing is fully retracted.

SERVICING

Renewing the filament bulb

14. Examine the bulb for signs of blackening or white streaks on the glass. If a new bulb is required, actuate the lamp housing to the fully extended position. Unclamp the front glass bezel ring by removing the clamping screw which locates through a bracket on the

lamp housing. Lift out the front glass and its sealing gasket. Remove the old and fit the new bulb (*Ref. No.* 5L/9954717). Clean the reflector and front glass with a clean, soft cloth. If necessary use soapy water to remove dirt. Avoid finger printing the bulb and reflector and do not use any polish for cleaning.

Renewing the front glass

15. Proceed as for renewing a bulb. Remove all broken glass and fit the new front-glass (*Ref. No.* 5CX/1515) with the gasket sealing ring (*Ref. No.* 5CX/2901), renewing this gasket if necessary. Replace the bezel ring securing it by the clamp screw to the bracket provided.

General

16. Check the lamp for security in the mounting. Check the operation of the lamp by a full functional test. Do not leave the filament burning for long periods in still air as the heat generated will adversely affect the length of life of the bulb. The general chapter on landing lamps is given in A.P.4343, Vol. 1, Sect. 21. For servicing of the operating unit, reference should be made to A.P.4343D, Vol. 1, Sect. 16.